PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT
(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 160261	**FOR FURTHER ACTION**	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
International application No. PCT/GB 03/01611	International filing date *(day/month/year)* 14.04.2003	Priority date *(day/month/year)* 12.04.2002

International Patent Classification (IPC) or both national classification and IPC
H04N11/02

Applicant
SENDO INTERNATIONAL LIMITED et al.

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 8 sheets, including this cover sheet.

   ☐ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

   These annexes consist of a total of   sheets.

3. This report contains indications relating to the following items:

   I   ☒   Basis of the opinion

   II   ☐   Priority

   III ☐   Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

   IV   ☐   Lack of unity of invention

   V   ☒   Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

   VI   ☐   Certain documents cited

   VII ☐   Certain defects in the international application

   VIII ☐   Certain observations on the international application

Date of submission of the demand 13.11.2003	Date of completion of this report 21.10.2004
Name and mailing address of the international preliminary examining authority: European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized Officer Corsi, F Telephone No. +49 89 2399-7926

Form PCT/IPEA/409 (Cover Sheet) (January 2004)

I. Basis of the report

1. With regard to the **elements** of the international application *(Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)):*

Description, Pages

1-3, 6-23	as originally filed
4, 5	received on 27.09.2004 with letter of 27.09.2004

Claims, Numbers

1-15	received on 27.09.2004 with letter of 27.09.2004

Drawings, Sheets

1/5-5/5	as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).

☐ the language of publication of the international application (under Rule 48.3(b)).

☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

☐ contained in the international application in written form.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority in written form.

☐ furnished subsequently to this Authority in computer readable form.

☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

☐ the description,   pages:

☐ the claims,   Nos.:

☐ the drawings,   sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

   (Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	3,4,7-9,12,14,15
	No:	Claims	1,2,5,6,10,11,13
Inventive step (IS)	Yes:	Claims	
	No:	Claims	1-15
Industrial applicability (IA)	Yes:	Claims	1-15
	No:	Claims	

2. Citations and explanations

   see separate sheet

Re Item V
Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Reference is made to the following documents:

    D1: PATENT ABSTRACTS OF JAPAN vol. 2000, no. 05, 14 September 2000 (2000-09-14) and JP 2000 056726 A (MITSUBISHI ELECTRIC CORP), 25 February 2000 (2000-02-25), and

    D1': US-B-6476824 (SUZUKI ET AL) 5 November 2002 (2002-11-05)

    D2: US-A-5 734 369 (LAPIDOUS EUGENE ET AL) 31 March 1998 (1998-03-31)

    D3: US-B-6 288 6981 (ISHII TAKATOSHI ET AL) 11 September 2001 (2001-09-11)

    D4: WO 98/10405 A (UNITED TECHNOLOGIES AUTOMOTIVE) 12 March 1998 (1998-03-12)

1.1 For assessing the merits of D1, use has been made of its automatic translation available from the JPO Internet site and of document D1', which is assumed to disclose in selected passages (see corresponding references in the following paragraphs) the same subject matter as D1.

2. The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of independent claims 1, 10, 11 and 13 is not new in the sense of Article 33(2) PCT, for the following reasons.

2.1 The following reasoning has been made under the assumption that the generic and unclear indication of "separating a stream of image or video data into a block of pixels" in claim 1 (lines 5 and 6) has no more limiting effect than indication of the identification of a block of pixels within said stream.

2.2 Document D1 discloses (see fig. 1-4,6,10,11, par.1,13-19, 22,26-34,40,42-54, 65-85; and D1', col.1 lines 6-11, col.2 lines 25-63, fig.2 and 3, col.4 lines 32-63, fig.4-6, col.5 line 14-55 and col.6 line 22-col.8 line 30, fig.11, col.8 lines 61-63, fig.14-16, col.9 line 49-col.12 line 14, col.10 line 30- col.12 line 14) a method of processing image data for a display, the method comprising the steps of:
    - identifying a block of pixels within a stream of image data (e.g. 2x2 pixels, see: D1, fig.3, par. 42,43,71-74, fig.10, par. 65,66; and D1', fig.5 col.6 lines 54-61, col.11 lines 39-42, fig.6 col. 10 lines 30-43), wherein each pixel within said block

comprises a first sequence of pixel bit values used for display (the 8 MSBs out of
10 bits corresponding to a pixel, see: D1, fig.1, 2 and 10, par. 34-35, 65,78; and
D1', fig.3 and 4, col.6 lines 24-36, col.10 lines 30-34, col.11 lines 43-47) for a
colour component of said image (see; D1, fig.1 par.169; and D1', col.21 lines 46-
53), and a plurality of bits to be discarded (the 2 LSBs out of 10 bits to a pixel,
see: D1, fig.2 and 10, par.40,77 ; and D1', fig.4 and 14, col.6 lines 25-43, col.10
lines 58-65);
- determining, for the block of pixels, a binary value of said plurality of bits to be
discarded (by means of the selector 18 in the 2nd embodiment, that selects the
non-displayable components of the values of four pixels in a 2x2 block, see: D1,
fig.10, par.70 ; and D1', fig.14, col.10 lines 37-55) and deriving an average value
of said binary values for the block of pixels (see: D1, fig.10 and 11, par.67, 70, 81-
84; D1', fig. 14-16, col.10 lines 34-37 and 45-55, col.10 line 66-col.11 line 38);
- modifying said first sequence of pixel bit values in a block of pixels in response to
said determined binary value in a way to form a reduced number of pixel bit values
that represent said colour component of a pixel within the block of pixels (by a
dither signal generator 16 and an adder 17, see: D1, fig.2, 6 and 10, par.49-
53,73,74; and D1', fig.4, 8 and 14, col.5 lines 47-55, col.10 line 56-57, col.11 lines
43-52), where pixels in a block that are to be modified (i.e. that have dither value
one) are determined by their position within the block, by the frame time and by
the derived average value (respectively through parameters h,v, f and a; see D1,
fig. 6 and 11, par. 73-78, 81-83; D1', fig.8, 15 and 16, col.10 line 66 - col. 11 line
38), in a way that in the end the number of said pixels to be modified within a
block is actually determined by the derived average value (see D1, par.74 and 78;
D1', fig.16, col.11 line 53 - col.12 line 3).
The derived average value may well be regarded as an offset for the colour
component of the pixels in a block (since it is indicative of the deviation of the
input colour data for the block of pixels w.r.t. the 8 bit colour values actually
displayed by the pixels), and consequently it can also be said that said offset is
used to determine the number of pixels within a block that are to be modified.
Therefore all the features of claim 1 are disclosed in combination in D1, and
consequently claim 1 is not new.

2.4 The subject-matter of independent claims 10, 11 and 13 is also not new in the
sense of Article 33(2), since:
- image and video processing systems and display drivers adapted to perform the
method steps of claim 1 are disclosed in D1 (see: D1, fig.1, par. 1,2,172; and D1',
fig.3, col.1 lines 6-11, col.4 lines 32 - col.5 line 13), which renders claims 10 and

11 not new;
- use of the display driver disclosed in D1 within a video communication device is also disclosed in D1 (the processed image signal may be a broadcast video signal, see: D1, fig.1, par. 28; and D1', fig.3, col.4 lines 38-42), which renders claim 13 not new.

3.   The subject-matter of independent claims 12 and 14 does not involve an inventive step in the sense of Article 33(3) PCT, for the following reasons.

3.1   In relation to claim 12, the implementation of a processing method as a sequence of processor-implementable instructions is a well known feature, see e.g. D2 (see col. 11 lines 34-41), where such implementation is disclosed for a method of processing image or video data for a display, in which method blocks of e.g.2x2 pixels are identified and a dithering process applied for a number of discarded bits. Recording a sequence of instructions on a storage medium, for controlling processors so as to carry out a method as in claim 1, would then be only a common option for the skilled person.

3.2   In relation to claim 14, the subject matter of such claim differs from the display driver disclosed in D1 (see par. 2.4 above) only in that a processor is used to perform method steps as indicated in claim 1. The use of a processor for carrying out a processing method is a common feature (see also par. 3.1 above) and would be introduced by the skilled person without use of any inventive skill.

4.   Dependent claims 2-9 and 15 do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of novelty and/or inventive step, for the following reasons.

4.1   In relation to claim 2, the determination of an average value of a colour component for the colours of a block of pixels is disclosed in D1 (see D1, par.67 and 72; and D1', col.10 lines 17-29); as the indication "baseline colour component" in claim 2 has no established technical meaning and is not previously defined in the claims, it has no limiting effect, and consequently claim 2 is not new.
In relation to claim 3, the determination of said average by adding the colour components from a block of pixel data and dividing the obtained sum by the

number of pixels in a block is a standard procedure based on the definition itself of average value, and would be applied by the skilled person just as matter of normal design procedure, which renders claim 3 obvious.

In relation to claim 4, D1 discloses the rounding of the calculated average value (see: D1, par.81 and 82; and D1', col.11 lines 3-8); truncation of said value instead would be only an obvious alternative for the skilled person. As the statement of purpose "to obtain..... within a block" in claim 4 (lines 13-15) has no limiting effect, claim 4 would be consequently obvious to the skilled person.

In relation to claims 5 and 6, D1 discloses:
- the modification of a bit of higher significance in the first sequence of pixel bit values with discarded bits of lesser significance (see: D1 par.53; and D1', col.7 lines 44-46, col.8 lines 15-23 and col.11 lines 43-52),
- the division of the offset by a multiple of the number of discarded bits (see D1, par.82 and D1'. col.11 lines 6-8, where a division by 4 is carried out for 2 discarded bits),
which renders claims 5 and 6 not new.

In relation to claim 7, omission of the modification of the first sequence of pixel bit values when such sequence comprises all "1" values is a common option in dithering methods to avoid bit-rollover (see e.g. document D3, fig.2, col.5 lines 32-38) and to that purpose the skilled person would apply it to the processing method described in D1 as matter of normal design procedure, which renders claim 7 obvious to the skilled person.

In relation to claim 8, D1 discloses the selective use of dithering only in cases when the gradation discernment capacity of the human eye is higher (see D1, par. 141-143). Document D4 discloses (see fig.2, page 3 lines 3-14) the selective use of dithering for portions of a display having low resolution, i.e. low level of image detail, where dithering procedures are more appropriate for gradation display, as they do not cause deterioration of the displayed image. The skilled person would apply the teachings of D4 to the processing method of D1 as matter of normal design procedure, to avoid said image deterioration, and would introduce selective dithering only for images with low image detail without use of any inventive skill, which renders claim 8 obvious to the skilled person.

In relation to claim 9, since it it not clearly expressed how the determination of a low level of image detail is based on pixel luminance values (lines 32,33), it has been assumed that no more limitations are introduced by the claim than indication that said level of image detail is determined based on measurements of pixel luminance. As any assessment of the level of image detail in a display area must necessarily be based on luminance values of the pixels in said area, also claim 9

would be obvious to the skilled person.

In relation to claim 15, D1 discloses the use of the display driver to display a brodcast video signal (see par. 2.4 above). Portable devices such as cellular phones and personal digital assistants arranged to receive brodcast video signals are well known, and use of the display driver of D1 in one of such devices would only be a common option, which renders claim 15 obvious to the skilled person.